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| APPLICATION NO.                                                                                                 | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
|-----------------------------------------------------------------------------------------------------------------|-------------|----------------------|---------------------|------------------|
| 09/813,692                                                                                                      | 03/21/2001  | Yutaka Shimizu       | 2500.65339          | 3442             |
| 7590                                                                                                            | 06/13/2006  |                      | EXAMINER            |                  |
| Patrick G. Burns, Esq.<br>GREER, BURNS & CRAIN, LTD.<br>Suite 2500<br>300 South Wacker Dr.<br>Chicago, IL 60606 |             |                      | BERNATZ, KEVIN M    |                  |
|                                                                                                                 |             |                      | ART UNIT            | PAPER NUMBER     |
|                                                                                                                 |             |                      | 1773                |                  |
| DATE MAILED: 06/13/2006                                                                                         |             |                      |                     |                  |

Please find below and/or attached an Office communication concerning this application or proceeding.

|                              |                              |                  |
|------------------------------|------------------------------|------------------|
| <b>Office Action Summary</b> | Application No.              | Applicant(s)     |
|                              | 09/813,692                   | SHIMIZU ET AL.   |
|                              | Examiner<br>Kevin M. Bernatz | Art Unit<br>1773 |

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

#### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

#### Status

- 1) Responsive to communication(s) filed on \_\_\_\_\_.
- 2a) This action is FINAL.                            2b) This action is non-final.
- 3) Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

#### Disposition of Claims

- 4) Claim(s) 2,3,5,6,11,12,14 and 15 is/are pending in the application.
  - 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) Claim(s) \_\_\_\_\_ is/are allowed.
- 6) Claim(s) 2,3,5,6,11,12,14 and 15 is/are rejected.
- 7) Claim(s) \_\_\_\_\_ is/are objected to.
- 8) Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

#### Application Papers

- 9) The specification is objected to by the Examiner.
- 10) The drawing(s) filed on \_\_\_\_\_ is/are: a) accepted or b) objected to by the Examiner.
 

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

#### Priority under 35 U.S.C. § 119

- 12) Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
  - a) All    b) Some \* c) None of:
    1. Certified copies of the priority documents have been received.
    2. Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
    3. Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

#### Attachment(s)

- 1) Notice of References Cited (PTO-892)
- 2) Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date \_\_\_\_\_
- 4) Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_.
- 5) Notice of Informal Patent Application (PTO-152)
- 6) Other: \_\_\_\_\_.

**DETAILED ACTION**

***Response to Amendment***

1. Amendments to claims 2, 5, 11 and 14 and cancellation of claim 1, filed on April 4, 2006, have been entered in the above-identified application.
2. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

***Request for Continued Examination***

3. The Request for Continued Examination (RCE) under 37 CFR 1.53 (d) filed on April 4, 2006 is acceptable and a RCE has been established. An action on the RCE follows.

***Claim Rejections - 35 USC § 102***

4. Claims 2, 3, 5, 6, 11, 12, 14 and 15 are rejected under 35 U.S.C. 102(e) as being anticipated by Kamiguchi et al. (U.S. Patent No. 6,495,275 B2) as evidenced by applicants' admissions and Sano et al. (U.S. Patent No. 6,391,431), for the reasons of record as set forth in Paragraph No. 6 of the Office Action mailed on September 30, 2005.

Kamiguchi et al. is relied upon for the reasons of record as set forth in Paragraph No. 6 of the Office Action mailed on September 30, 2005.

Regarding the amended claims, the Examiner notes that applicants' have placed claim 2 into independent form (and have cancelled previous independent claim 1), and have added the limitation of "face-centered tetragonal" to both claims 2 and 11.

The Examiner notes that Kamiguchi et al. fail to explicitly disclose using a face-centered tetragonal (FCT) antiferromagnetic layer (AF layer), though Kamiguchi et al. does teach that the AF layer can be formed of IrMn (15-25 at% Ir), PtMn (40-60 at% Pt) or FeMn (40 – 60 at% Fe) (col. 14, lines 41 – 49).

The Examiner notes that one of ordinary skill in the art would readily appreciate that PtMn AF layers are inherently FCT, as evidenced by applicants' admissions (page 1, 2<sup>nd</sup> Paragraph) and Sano et al. (col. 1, lines 51 – 62; col. 3, line 46 bridging col. 4, line 16; and col. 7, line 49 bridging col. 8, line 59 – which teaches that PtMn must be transformed to a FCT structure in order to possess antiferromagnetic behavior).

As such, the Examiner notes that while the specific embodiment relied upon in the rejection of record (Paragraph No. 6 of the Office Action mailed September 30, 2005) utilizes a IrMn AF layer, Kamiguchi et al. provides sufficient specificity that PtMn FCT AF layers are also within the scope of the disclosed invention.

### ***Claim Rejections - 35 USC § 103***

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

6. Claims 2, 3, 5, 6, 11, 12, 14 and 15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kamiguchi et al. as applied above, and further in view of Sano et al. ('431 B1).

Regarding claims 2 and 11, Kamiguchi et al. is relied upon as described above.

While the Examiner maintains that there is sufficient specificity to anticipate the claimed invention, the Examiner acknowledges that Kamiguchi et al. fail to explicitly disclose using a FCT AF layer or a PtMn AF layer inherently possessing a FCT structure.

However, Sano et al. teach that it is known in the magnetic head art that the use of FCT PtMn AF layers results in AF layers with high blocking temperatures (*col. 1, lines 51 – 62; col. 3, line 46 bridging col. 4, line 16; and col. 7, line 49 bridging col. 8, line 59*). Furthermore, the Examiner notes that Sano et al. teach PtMn AF layers which possess the identical compositional ranges as in the Kamiguchi et al. invention.

It would therefore have been obvious to one of ordinary skill in the art at the time of the applicant(s) invention to modify the device of Kamiguchi et al. to utilize an AF layer possessing a FCT lattice structure as taught by Sano et al., since AF layers possessing FCT lattice structures result in AF layers having high blocking temperatures.

Regarding claims 3, 5, 6, 12, 14 and 15, these limitations are met for the reasons already of record.

***Response to Arguments***

**7. The rejection of claims 2, 3, 5, 6, 11, 12, 14 and 15 under 35 U.S.C § 102(e) and/or 103(a) – Kamiguchi et al., alone or in view of/evidenced by various references**

Applicant(s) arguments have been considered but are moot in view of the new ground(s) of rejection. In so far as they apply to the present rejection of record, applicant(s) argue that Kamiguchi et al. fail to teach or suggest “a polycrystalline antiferromagnetic layer having a face-centered tetragonal lattice structure” (*pages 6 – 7 of response*). The Examiner respectfully disagrees.

First, the Examiner notes that Kamiguchi et al. teach three materials as suitable for the antiferromagnetic (AFM) layer, including PtMn (40 – 60 at% Pt). As noted in the rejections of record, one of ordinary skill in the art would readily appreciate that PtMn (40 – 60 at%) must inherently possess a FCT lattice structure in order to be an AFM material (i.e. PtMn is only antiferromagnetic if it possesses an FCT lattice structure and since Kamiguchi et al. teach PtMn as an antiferromagnetic material, it must therefore be in the FCT phase). Second, the Examiner notes that a secondary reference has been applied that teaches the benefits of using FCT AFM layers versus disordered IrMn-type AFM layers.

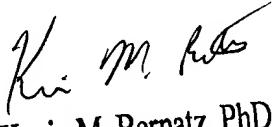
***Conclusion***

8. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Kevin M. Bernatz whose telephone number is (571) 272-1505. The examiner can normally be reached on M-F, 9:00 AM - 6:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Carol Chaney can be reached on (571) 272-1284. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

KMB  
June 7, 2006



Kevin M. Bernatz, PhD  
Primary Examiner